197 Increased nitrite in exhaled breath condensate (EBC) in patients with CF: a product of pharyngo-oral bacterial activity

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Introduction: Several studies have shown increased nitrite levels in EBC in patients with CF, and this has been suggested to be the result of increased nitric oxide (NO) formation within the lower airways. However, we have previously shown that EBC nitrite originates primarily in the pharyngo-oral tract in healthy subjects, and that it is a product of bacterial activity.
Methods: This study was performed in 15 patients with CF (10–43 years, 7 female) and 15 age-matched healthy control subjects. Exhaled NO (Niox, Aerocrine), and nitrite in saliva and EBC (EcoScreen, Jäger) were measured before and 5 min after a mouthwash with an antibacterial agent (chlorhexidine 0.2% for 30 s), a procedure which is known to reduce exhaled NO and nitrite levels in saliva and EBC in healthy subjects.
Results: At baseline, exhaled NO was lower in CF patients compared to controls (10.0±0.9 v. 13.4±1.7 ppb, $p < 0.05$; mean±SEM). In contrast, EBC nitrite was higher in CF patients (5.2±1.4 v. 2.5±1.1 μM, $p < 0.05$). Furthermore, salivary nitrite was increased in CF patients (347±88 v. 122±40 μM, $p < 0.01$), and there was good correlation between nitrite levels in EBC and saliva ($r = 0.65$, $p < 0.05$). Chlorhexidine mouthwash further separated the exhaled NO levels in the two groups, indicating a partial masking of the reduced airway NO formation in CF by increased oral NO formation from nitrite.
Conclusion: Our findings suggest that increased EBC nitrite in CF patients are related to salivary nitrite, thus indicating altered anaerobic bacterial activity in the pharyngo-oral tract in these patients.

198* ^{18}FDG-PET/CT contribution to the assessment of lesion severity in cystic fibrosis (CF)

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Objectives: Few non-invasive methods are available to monitor disease activity in CF. Chronic lung inflammation is complicated by bouts of superimposed infection. Our aim was to evaluate use of PET/CT for assessment of the severity of lung inflammation/infection in CF.
Methods: PET/CT was performed for 15 patients (pts) (age: 14–54 yrs) followed in the CF clinic. SUV was measured in normal lung and disease burden was evaluated by calculating the mean value for the SUVmax (MSUV) of all lung foci. PET severity score (PSS) was based on the number of foci and their MSUV. PET/CT reading was blinded to clinical data. Correlative data included current FEV_1 and sputum bacteriology.
Results: According to PSS, pts were assigned to 4 groups: normal (grade 0), mild (1), moderate (2), severe (3).

Table 1 – PET Severity Score

PET score	N of foci	MSUV	N of patients
0	0	0	1
1	1–3	up to 1.6	5
2	2–7	2–2.3	6
3	7–9	2.03–2.91	3

MSUVs of groups 1, 2 and 3 were 5, 7 and 10 times higher than SUV of normal lung background (0.3) respectively. Extensive PET abnormalities were correlated with atypical mycobacterium infection in all 3 pts of the severe group. In the 12 other pts, despite widespread CT findings (multiple bronchiectasies, infiltration, nodules, ground glass), there were relatively few foci of mild to moderately increased FDG uptake on PET. Furthermore, no correlation was found between PET and FEV_1.
Conclusions: Our small series suggest the feasibility of using PET to assess lung inflammation in CF, using PSS based on MSUV and number of foci

199 Radiation dose estimation from thoracic CT scans in a CF population

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At present, CF centres are using CT scans to monitor CF lung disease. Very few data are available on the effective dose calculation even though this is a key factor in assessing CT protocols, particularly in pediatric patients.
Objective: To calculate the organ dose and the effective dose from thoracic CT scans in a CF population.
Methods: The dose calculation was based on ImpactScan software and used a phantom model age-corrected for children. Effective radiation doses per CT was calculated from protocol information and radiation measurement in 42 typical CF patients followed in our centre and having thoracic CT before December 2004.
Results: The average was 0.6 CT per year (0.1–1.9). Age at first CT was 6.5 years (0.2–35) with 3.8 years (0.2–21.2) follow-up. 3 patients died (3.8%) and the survival rate was 85.1% at 29 years old ($\sigma = 10.4\%$). The cumulative organ doses from thoracic CTs at 5, 10 and 20 years were respectively 6.3, 9.7 and 15.4 for lungs; 1.72, 2.68 and 4.36 for bone marrow; 1.41, 2.45 and 6.15 for kidneys and <1 mSv for liver, brain and gonadal tissues. The cumulative effective dose (mSv) per patient was 7.7 at 5 years, 16.1 at 10 years, 27.6 and 23 at 30 years.
Conclusion: In this CF population, effective doses from thoracic CT scans were moderate regarding environmental exposure and carcinologic risk. The radiation dose from thoracic CTs performed with new radiological protocols that use 1 mSv and protection regarding all tissues out of the area of interest should be lower than in the past.

200 Clinical usefulness of bronchoalveolar lavage (BAL) of patients with Cystic Fibrosis

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Aims: Children and adults with CF exhibiting clinical or respiratory deterioration despite routine treatment strategies. Patients who do not produce sputum reliably may be subject to an invasive procedure of BAL for more precise microbiological investigations. This study aimed to retrospectively evaluate the value of BAL as a supplementary diagnostic tool for exacerbation in CF lung disease.
Methods: 30 files of CF-patients (14F/16 M, mean range 14 yrs, range 2–38) were reviewed in a retrospective study of all BAL-procedures performed during the period from 2003 to 2005. 282 CF patients are followed on a regular monthly basis in outpatient clinic at our centre. Indications, clinical condition, lung function parameters, radiological findings and bacteriology were registered.
Results: 36 BAL were performed in 30 patients with CF. The indication were increased cough in 50%, declining lung function in 47% and increased sputum production in 30% of all cases. Microscopy of BAL resulted in change of antibiotica regimen in 16% of the cases and results of culturing changed the treatment in 72% of cases. The result of antibiotica resistance analysis changed treatment in 25% of all cases. No complication to BAL was registered.
Conclusions: BAL is a safe procedure and contributes considerably to more specific diagnosis of reasons for pulmonary symptoms in CF and to changes in treatment regimens. Particularly, in the cases where symptoms continued in spite of antibiotic treatment, BAL seemed to be of overall importance to point out the relevant microbiological agents.